

WHAT IS CLAIMED IS:

1. A vascular device comprising a plurality of vessel engaging members and a valve, the device movable from a collapsed insertion position having a first diameter to a second expanded position having a second diameter larger than the first diameter, the plurality of vessel engaging members extending outwardly from the device for securely engaging the internal wall of a vessel upon expansion of the device to the second expanded position, the vessel engaging members pulling the internal wall of the vessel radially inwardly upon movement of the device from the second expanded position toward a first expanded position having a third diameter, the third diameter being greater than the first diameter and less than the second diameter, and in the first expanded position the valve movable between an open position to allow blood flow therethrough to a closed position to prevent blood flow.
2. The vascular device of claim 1, wherein the device is composed of shape memory material and the first expanded position substantially corresponds to the memorized position of the device, and the device is expanded to the second expanded position by an expandable device positioned within the device.
3. The vascular device of claim 1, wherein the device is composed of shape memory material and is initially movable from the collapsed position to the first expanded position in response to exposure to body temperature, and is subsequently moved from the first expanded position to the second expanded position by an expandable member.
4. The vascular device of claim 1, wherein the device is composed of shape memory material and is movable from the collapsed position to the second expanded position by the substantial simultaneous exposure to body temperature and expansion by an expandable member.
5. The vascular device of claim 1, wherein the valve is substantially conical in shape.

6. The vascular device of claim 5, wherein a longitudinal axis of the valve is offset from a longitudinal axis of the vascular device.
7. The vascular device of claim 1, wherein the valve includes a plurality of blood drainage openings extending through a side wall.
8. The vascular device of claim 1, wherein the valve has a proximal opening and a distal opening, and a reinforcement ring adjacent the distal opening.
9. The vascular device of claim 1, wherein the valve is attached to a distal end of the vascular device to extend downstream of the device when positioned within a patient.
10. The vascular device of claim 1, wherein the valve is attached to a proximal end of the vascular device to extend within a central portion of the device when positioned within a patient.
11. The vascular device of claim 1, wherein the valve is a duckbill valve configuration.
12. A vascular system comprising:
 - a balloon catheter having an elongated shaft and an expandable balloon;
 - a vascular device mounted over the expandable balloon having a first position and a second expanded position, the vascular device expandable to an expanded position to engage the vessel walls and returnable substantially to the first position to bring the walls radially inwardly; and
 - a valve connected to the vascular device and movable between a closed position to prevent blood flow and an open position to allow blood flow therethrough.
13. The vascular system of claim 12, wherein the vascular device is comprises shape memory material and is expandable first to a memorized condition in response to

exposure to body temperature and subsequently expanded to the expanded position by inflation of the balloon.

14. The vascular system of claim 12, wherein the vascular device is expandable to the expanded position as the device is substantially simultaneously exposed to body temperature and the balloon is inflated.

15. The vascular system of claim 12, wherein the device comprises stainless steel and the balloon expands the device below its elastic limit to allow the device to return to the first position.

16. The vascular system of claim 12, wherein the vascular device is releasably connected to the balloon.

17. The vascular device of claim 12, wherein the valve includes a plurality of blood drainage openings extending through a side wall.

18. A method for treating venous valve insufficiency comprising:
inserting a delivery device and a vascular device having a replacement valve into a target vessel adjacent the region of the removed portion of leaflets;
deploying the vascular device to an enlarged diameter to securely engage the internal wall of the vessel; and
reducing the diameter of the vascular device to move the vessel wall radially inwardly to reduce dilation of the vessel and implant the replacement valve.

19. The method of claim 18, further comprising the step of removing at least a portion of vein valve leaflets of a patient prior to deploying the vascular device.

20. The method of claim 18, further comprising the step of deploying the vascular device to a first expanded diameter prior to deploying the device to the enlarged diameter, the step of deploying the vascular device to a first diameter including the step

of exposing the vascular device from a sheath of the delivery device to enable the vascular device to return a shape memorized configuration in response to being warmed by body temperature, the first expanded diameter being less than the enlarged diameter, and the step of reducing the diameter of the vascular device returns the device to a diameter substantially equal to the first expanded diameter.

21. The method of claim 18, wherein the step of the deploying the vascular device to an enlarged diameter includes the step of inflating a balloon positioned within the device, the step of inflating the balloon enabling a plurality of vessel engaging members of the vascular device to penetrate and retain the vessel wall.

22. The method of claim 18, wherein the vascular device is composed of stainless steel and the step of deploying the vascular device expands the device below its elastic limit to enable it to return to its reduced diameter when the balloon is deflated.

23. The method of claim 18, wherein the delivery device is inserted through the jugular vein or the femoral vein into the popliteal vein or the saphenous vein.

24. The method of claim 18, wherein the step of deploying the vascular device to an enlarged diameter comprises releasing the vascular device from the delivery device to enable it to return to a shape memorized condition and substantially simultaneously inflating a balloon.

25. A replacement valve comprising a support structure and a valve attached thereto, the valve being substantially conical in configuration and having a proximal end, a distal end, and a proximal and distal opening, the distal opening facing away from the longitudinal axis when the valve is in the closed position and aligned with the longitudinal axis when the valve is in the open position.

26. The replacement valve of claim 25, wherein the valve is attached to a proximal end of the support structure.

27. The replacement valve of claim 25, wherein the valve is attached to a distal end of the support structure.

28. The replacement valve of claim 25, wherein the valve is offset with respect to the longitudinal axis of the support structure.

29. The replacement valve of claim 25, wherein the valve includes a plurality of drainage opening formed in a side wall adjacent the proximal end.

30. The replacement valve of claim 25, wherein the support structure is in the form of a cylinder.